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ABSTRACT

This practicum was designed to utilize local outdoor resources as a teaching tool and an extension of the classroom. The single goal was to make utilization of this instructional strategy a permanent part of the school curriculum. On-site research, coupled with an extensive review of current literature, produced the finding that the problem lay in the difficulty of implementing such an approach. An interdisciplinary program of environmental studies was chosen as the vehicle through which the situation that existed could be transformed to the desire outcome. The curriculum for this program was designed around the notion of utilizing local outdoor resources as both an extension of the classroom and a means to engage students actively in the learning process. The findings of the practicum were positive. Use of local outdoor resources was integrated successfully into the curriculum and proceeded to provide a uniquely successful instructional strategy. Since the results of this project were constructive, this model can be recommended to similar curricular applications. (Author/DB)

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Utilizing Local Outdoor Resources as a High School Laboratory for Learning: The Problem of Implementation

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William H. Crumley

Cluster 43

A Practicum I Report presented to the
Ed.D. Program in Child and Youth Studies
in Partial Fulfillment of the Requirements
for the Degree of Doctor of Education

NOVA University

1992

SO 022 752

PRACTICUM APPROVAL SHEET

This practicum took place as described.

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This practicum was submitted by William Crumley under the direction of the advisor listed below. It was submitted to the Ed.D. Program in Child and Youth Studies and approved in partial fulfillment of the requirements for the degree of Doctor of Education at Nova University.

Approved:

June 24, 1992
Date of Final Approval of Report

Paul Borthwick
Paul Borthwick, Ph.D., Advisor

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Abstract

Utilizing Local Outdoor Resources as a High School laboratory for Learning: The Problem of Implementation, Crumley, William H., 1992: Practicum report, NOVA University, Ed. D. Program in Child and Youth Studies. Descriptors: Environmental Education / Outdoor Education / Wilderness Education / Ecology Education / Interdisciplinary Education.

This practicum was designed to utilize local outdoor resources as a teaching tool and an extension of the classroom. The single goal was, that utilization of this instructional strategy become a permanent part of the school curriculum.

On-site research, conducted by the writer, coupled with an extensive review of current literature, produced a finding that the problem lay in the difficulty of implementing such an approach. An interdisciplinary program of environmental studies was decided upon as the vehicle through which the writer would transform the situation that existed to the desired outcome. The curriculum for this program was designed around the notion of utilizing local outdoor resources as both, an extension of the classroom and, a means to actively engage students in the learning process.

The findings of the practicum were positive. Use of local outdoor resources was successfully integrated into the curriculum and proved to provide a uniquely successful instructional strategy. Since the results of this project were constructive, this model can be recommended to similar curricular applications.

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Chapter I

Introduction

Description of Community

The setting of the problem which is the topic of this paper was a small remote border community in northwestern Maine. The problem presented was not unique to, nor limited to, that particular geographic situation and, in fact, could occur in either urban or rural settings anywhere. In order to appreciate the problem, as addressed herein however, it is necessary to understand the distinct geographical characteristics of the community and the somewhat unique characteristic of the school involved.

The community in which this practicum took place epitomizes the term "geographically displaced". This village with its approximate 1200 occupants, together nestled in the boundary mountain region, have the unique distinction of being one hundred miles from anywhere or anything. This includes movie theater, shopping center, university campus, or fast food.

For well over a century this French and English bilingual community has thrived on a dual economic base, logging and tourism. In addition, the community serves as a Port of Entry between Quebec Province and the United States. Despite its remoteness, the community is not necessarily economically depressed as one might think. In recent years unemployment has stayed around the zero mark, as the traditional lumbering and tourist trades continued to produce more jobs than the local labor market could provide. Often, manpower for the logging industry must be imported from neighboring Canada to facilitate working the hundreds of thousands of acres of woodland which surround the community.

Historically, the tourism sector of the local economy has thrived on outdoor recreation. Ultimately flowing into crystal clear streams, countless hundreds of pristine ponds and lakes dot the vast woodlands of the region. For over a century this woods and waters combination has provided some of the most lucrative trout fishing and deer hunting in the eastern United States.

Recently however, as fish and wildlife populations have declined due to a combination of many factors, conceivably including poor resource management

and degradation of the local environment, the tourism sector has witnessed a shift in its clientele. While fishing and hunting are still an important segment of the tourist economy, today, snowmobiling is "king". In addition, other outdoor sports which do not rely on fish and game populations, such as canoeing, hiking, and cross-country skiing, are locally on the rise.

In short, the area is a remote wilderness with a dual faceted economy, both segments of which are dependent on the local natural resource base for survival.

Description of Work Setting

Within the confines of one of the smallest and most rural school districts in the state, the practicum herein described was undertaken. The district serves the educational needs of the community described above as well as providing services for several "unorganized townships" which abut the district geographically. Administratively, the school district is ruled by a seven member elected directorship and one full-time superintendent/principal

The physical plant consists of one, K through 12, consolidated school building. The building, situated on an eleven acre tract of field and woodland, is

divided into three wings - one elementary, one middle-school, and one high school. A central common area consisting of a gym, library, and dining area link the three wings together.

The K through 12 faculty consists of 22 members, seven of whom are located at the high school level where this practicum took place. In addition to the faculty, there are normally about a half dozen support personnel working in a variety of roles.

Description of Population Involved

The K-12 student population within this school district averages around 260 students with about 25% of those making up the high school population. At the time of this writing the high school student body consisted of 68 individuals, yielding a 1:10 teacher/student ratio.

The typical graduating class averages somewhere around 15 students, about 50% of whom will go on to some form of higher education. Some of those who do not go on to school remain in the community and become a part of the local work force. In addition, a few of those students who obtain further education return to the community and, they also join the local labor pool.

In short, many of those who attend this school

system will at least for some portion of their career life become a part of the dual economic system described earlier.

Description of the Writer's Role

The writer constitutes the entire social studies department at the high school level. The position requires the teaching of five or six classes per day and fulfilling the duties of a department chairperson. In addition, the writer facilitates curriculum development and the subsequent piloting and implementation of new social studies programs.

In a typical year, the writer will work with about 75% of the high school student population. The average social studies class size normally falls around 8 or 10 students.

Within the academic limitations and restrictions of this very small school district, within the narrow scope of the community's economic base and resources, and within the uniqueness of the work setting, lies the educational mission of the writer. It is very appropriate for the writer to undertake instructional endeavors which will be both academically rewarding and relevant to the present and future lives of the student body. In the instance of this specific endeavor, the

appropriatness factor is enhanced by the writer's twenty - plus years of activity in the out-of-doors of the region. Hence, this practicum project.

Chapter II

Study of the Problem

Description of the Problem Situation

The problem addressed in this practicum was that despite their availability and accessibility, local outdoor resources were not utilized as a teaching tool. Although the problem setting, in this instance, appeared at first glance to be very conducive to such an instructional approach, outdoor education was not being utilized as a part of the curriculum. After an initial review of the context and framework of the local educational and instructional strategies (i.e., written curriculum and taught curriculum), and an extensive review of the current literature on the subject, the problem was stated and acted upon as: "While there is ample evidence to support the use of local outdoor resources as a living outdoor classroom, there is, conversely, evidence that suggest it is difficult, at best, to implement such an instructional strategy".

Inherent to curriculum development in the small

rural setting is the need for ingenuity - perhaps better described as resourceful and creative instructional design. The task, or as is more often the case, the challenge of developing such innovative educational material fell on the lone department member in this particular setting.

Among the benefits of a single staff department is the ease of reaching consensus, stemming from the philosophical homogeneity present. In the case of this social studies department, it was unanimously agreed upon that students needed to be actively engaged in the learning process. A further certainty was that a possible vehicle for facilitating this concept was the use of the out-of-doors. Moreover, it was noted that this instructional practice was non-existent, at least in the social studies department.

When an entire high school is confined to one wing of a building, one most often has a sense of what is taking place down the hall. In this instance, it occurred to the writer that science classes as well as other disciplines, were not actively engaging students in learning outside of the classroom. Furthermore, the writer had no recollection of any curricular or policy mechanism which specifically encouraged the use of, or provided access to, outdoor resources. Why? It was

evident that the faculty were, in most instances, reluctant to consider such an approach because of the difficulties of implementing non-traditional methods of teaching.

In brief, it appeared that despite their bountiful scope and close proximity, local outdoor resources were not being utilized as the potentially dynamic instructional tool this writer believed they afforded. Why?

Problem Documentation

Documentation of the absence of any local educational program which capitalized on the region's outdoor resources was not a difficult research task. Nor was it arduous to search for any vestiges of prior attempts to implement such activities.

A poll of the faculty was conducted on a very informal basis simply by going from faculty member to faculty member and discussing the question at hand. The writer's notion was confirmed. It was learned that use of local outdoor resources in the curriculum was almost non-existent. It appeared that, at best, less than 1% of class time was utilized in this fashion with the bulk of this usage stemming from the science department.

Subsequent to the faculty interviews, a review of all school district written material which might attest to the problem was conducted. This included reviewing written curriculum documents, course descriptions, and the school handbook. The written material was silent and void of any attempt to promote out-of-doors education. In addition and as a side note, it was also detected in this curriculum review that, the local environment and more globally, environmental studies in general did not command a high priority.

Causative Analysis

By virtue of constituting 1/7 of the high school faculty himself, the writer felt that by his own instinct and work place savvy he could identify the cause. None the less, it was felt that in order to validate the writer's intuition, a probe of the faculty was in order. A formal instrument to pinpoint the cause of the problem was not developed, nor was it deemed necessary in this particular work setting. The writer chose instead to use an ongoing dialog with the faculty as a mechanism to ferret out the reason for this curricular omission.

The results of the investigation indicated that there were four reasons causing the local resource base

to be bypassed as an instructional tool. The probe further demonstrated that all four causes were directly linked to implementation of such a teaching strategy.

First, large class size often restricted the teacher's capacity to attempt field-based learning. Despite the fact that this particular school's class rosters are comparatively small, most teachers felt it an inconvenience to move a class session outside and provide a meaningful learning experience. This concern was further complicated by the 45 minute standard class period.

Second, even when extended class sessions or part of a school day could be allocated to outdoor activities, the high cost of transportation became a deterrent. In plain language, busing is very expensive, even for short distance local trips. This school district, like so many others, has experienced budget constraints in the recent past and the general rule has been to curtail hired transportation in other than essential activities.

Third, most teachers simply did not feel comfortable about leaving the more familiar four walls of their classroom. In addition, some seemed to lack the confidence to attempt to add a non-traditional flare to their instructional repertoire. A statement

heard more than once was, "what do I do with them after I get them out there?"

Fourth and last among the concerns was the notion that, more often than not, specialized equipment was required to attempt any type of field-based learning and that the equipment was non-existent. This was particularly a concern of science related staff members.

Literature Review

In the twenty-plus years since the first "Earth Day", limited professional discussion has been conducted regarding the utilization of outdoor resources as an instructional vehicle. Studies found in the literature were convincing as to the benefit of this educational approach, however, a closer look indicated that implementation of such a strategy is often confronted with a variety of stumbling blocks.

Citing the "sorry state of science education" (p.18) in the United States, Sacshe (1989) pointed out the need for reform which would alter not only curriculum content but also require educators to rethink educational design for science related subjects. Sacshe alleged that there is currently too much emphasis on memorization of facts and trivia, at the expense of true understanding of concepts, and advocated that the

curriculum needs to both actively engage students and, "be made more relevant to students' daily lives" (p.19). In addition, the report emphasised the need for science to be integrated with other subjects as part of an interdisciplinary curriculum.

A potential mechanism to address the curricular dilemma posed in the paragraph above was suggested by Hale (1986), that being the often overlooked potential use of local outdoor resources as a base on which to build a multidimensional curriculum. Hale quickly cautioned, however, that there are major constraints and difficulties when attempting to implement such a strategy. After discussing a half dozen of these implementation obstacles, Hale concluded that what we need is "a change in attitude toward using the local environment". (p.184)

Tracing the roots of outdoor education in American education culture, Miles (1986), on the other hand, identified this mode of instruction as, not being a new concept, but rather "an educational tradition in America" (p.33). Miles proceeded to depict an evolutionary process which has transformed 'outdoor education' to 'environmental education' (p.34), and cautioned that although there exists "intrinsically educative qualities" in outdoor instruction, "leadership" and

"organization" are vital prerequisites for implementation of such instruction (p.39).

The literature bears out the fact that a minority of battle hardened teachers have been fighting the difficult task of implementing outdoor based programs for at least the past two decades while, at the same time, a majority of teachers remain skeptical about giving up their more traditional instructional methods for the out-of-doors.

A little more than a score ago, Haven Kolb (1971) presented a paper at a meeting of the American Association for the Advancement of Science addressing the potential of science/social science team teaching efforts utilizing environmental studies. As for the problem of implementation when studies went beyond the classroom door, however, Kolb was quick to point out that "students...have run into frustration and find the public quite apathetic".

Six years after Kolb delivered this paper advocating for these innovative curricular changes in the delivery of science related courses, Hug (1977) was able to compile adequate statistics to at least begin to assess implementation efforts. While Hug's findings did not delineate the use of outdoor resources in the schools surveyed, the bottom line of the findings was,

that at least for most small schools, adoption of a "team taught environmental education course" had a good chance of abandonment after attempts at program application. Hug did not go into detail as to why many programs failed, but two factors singled out in one of the case studies were, (1) The "unanticipated problem...of student ability to handle the [non-traditional mode of] learning" and (2) teacher discouragement stemming from the "unanticipated... 'friendly' ribbing and gibes of some of the other teaching staff" (p.401). While Hug's findings are vague, it appeared here, as in much of the other literature, that the breakdown comes in the actual implementation.

By the mid 1980s, a study conducted nationally by Keown (1986) revealed that at best, the average science student might utilize the outdoors about three times a year. Keown's research further indicated that about 16 percent of science classes do not use the outdoors at all. Additionally, Keown's survey findings uncovered that even when outdoor resources were utilized, they were primarily found on the school site and were not off-site resources. Why? Keown's evidence pointed to the implementation phase.

Almost two decades after the first "earth day",

Project WILD director, Cheryl Charles (1988), speaking before a group of educators in Illinois, called on teachers to provide environmental education in community settings. Charging elementary teachers, Charles accused that "most teachers do not open the classroom door to go outside into... the out-of-doors" (p.15). Charles' rationale for moving instruction outdoors implied that classroom-based teachers were not giving "their students a living context for understanding and applying the concepts and skills they are studying" (p.15). As to the counterparts of the elementary teachers at the secondary level, Charles complained that curriculum suffered from "fragmentation and specialization" - there was no "holistic" approach. A program of study built around the environment and ecology utilizing the out-of-doors might provide this common core. Charles, in expressing dismay, presented statistics which alleged that 90 percent of teachers were still textbook bound 90 percent of the time.

The findings of the literature documented other similar problems and suggested possible causes surrounding the difficulty involved in implementing a program of study which utilizes local outdoor resources. According to the information found in the

literature, the obstacles were numerous and varied and ranged from the instructional mind set of the individual teacher to the logistical problems associated with transporting and managing a class once outside the schoolhouse door.

Tharp and Gallimore (1989), in calling for a new definition of teaching, depict contemporary teachers, like their counterparts of the past century, as being locked into a traditional teaching mold. The pair cited evidence provided by former Secretary of Education, William Bennett, revealing that "in three major studies, the National Science Foundation found that most science education followed the traditional practice [of]...recitation...lecturing...[and] textbook" (p.21). While Tharp and Gallimore did not specifically advocate for outdoor education, their research pointed out the necessity for educators to break the traditional mold and move to "settings that give learning a chance" (p.23).

Priest (1986) viewed a historic problem in the implementation of outdoor education in the very definition of the term and eluded to the fact that there exists much confusion among educators as to what curricular function the outdoors should serve. Priest pointed out the many singular aspects of why a teacher

might employ the out-of-doors such as, conservation education, experiential learning, recreational education, instructional method for learning, etc. Priest concluded, however, that the obstacle that must be overcome is in getting teachers to accept that outdoor education is "a matter of many relationships" (p.13). Outdoor education does not serve a single curricular function but is a thread, a common core, linking together interdisciplinary curriculum matter.

Keown's survey of 1702 educators (1986), drove home the fact that the problem of implementation, as stated in this paper, is both real and widespread. Educators responding to Keown's national poll indicated that the greatest deterrent to the implementation of a program of outdoor education was financing and travel. Other major problems listed by educators were the logistical problems associated with large class sizes and conflicting class schedules (p.25). In a follow up commentary to this survey, Keown (1986) eluded to an additional problem that perhaps teachers themselves lacked an adequate "portfolio of meaningful outdoor science activities" (p.31).

Hale (1986), researching in England rather than the United States, concurred with the findings of Keown's

survey and listed major constraints for lack of utilization of the out-of-doors as funding, travel, teacher confidence, scheduling, and large class size. Hale concluded that the greatest problem present was the need for "a change in attitude toward using the local environment and a reorientation...to maximize the educational value of the local environment" (p.184).

The literature reviewed by the writer was not limited to the subject of local resources as an instructional tool but included science education, environmental education, social studies education, curriculum development, wilderness education, and interdisciplinary education.

While the base of available literature on the specific topic at hand might have been small, there was validity and significance in the consistency of the findings. While there existed ample evidence to support the use of local outdoor resources as a living outdoor classroom, there was, conversely, evidence that suggested it is difficult, at best, to implement such an instructional strategy.

Chapter III

Anticipated Outcomes

The following goals and outcomes were projected for this practicum:

Goal Statement

The writer had one goal alone in mind, that being, the use of local outdoor resources, as a laboratory for learning, become a permanent fixture in the school curriculum.

Specific Objectives

The writer proposed the following specific objectives as a vehicle toward realization of the stated goal. Accomplishment of the stated objectives constituted a successful implementation.

* A full year, interdisciplinary, elective course in grades eleven and twelve, which utilizes outdoor resources as a living classroom laboratory, will be developed and instituted.

* Such a course of instruction will utilize the topic of "environmental studies" as a common core thread, around which to weave an interdisciplinary, multidimensional curriculum design.

* A minimum of 15% of the instructional time of this newly developed program will take place outside of the traditional classroom walls.

* Curriculum design will promote and provide experiential activities which will allow students to become active participants as opposed to passive recipients in the learning process.

Evaluation

Because the goal of this project was straightforward and singular - the usage of local outdoor resources within the curriculum framework - a specific evaluation instrument was not designed and was not deemed necessary. Instead, a summative evaluation utilized the following three tools as instruments to measure goal and objective success.

* The written curriculum. This document was reviewed by the writer during its developmental phase to insure inclusion of the goals and objectives stated previously. Additionally, the writer conducted a formative evaluation throughout the implementation

phase to insure consistency with the stated strategy. During this implementation period, minor curriculum revision was necessary. Finally, the writer conducted a summative evaluation after the implementation was complete. At this juncture, the writer completed a final review of the curriculum.

The written curriculum was an effective vehicle for assessing course content, goals, objectives, etc. The selection of curriculum as an evaluation tool is requisite in the assessment of any educational program.

* A daily written log outlining the class activities as they are actually taking place (i.e., the delivered curriculum) was maintained by the writer. This record served to not only tabulate class activities but also note problems, and suggestions for future reference. Additionally, this log measured and verified compliance with the written curriculum. That is, it served as documentation that the delivered curriculum was in accord and compliance with the written curriculum.

Because the delivered curriculum does not always match the requirements or expectations of the written curriculum, an "as-taught" log was necessary to determine actual instructional activities.

* Under the supervision of the writer, the

students filmed a video record of all activities which took place outside of the classroom and also those which occurred indoors but might be labeled as non-traditional, that is, other than the textbook/ lecture syndrome. The video journal complimented and enhanced the written records when the success of the program was finally evaluated. A further rationale for utilization of this assessment tactic lies in the realization that since some of the performance expectations were abstract in nature (e.g.,experiential, active participant, etc.), video was probably the most appropriate and the most useful documentation device.

Simply stated, these three evaluation tools in combination served the function of measuring the program success at meeting the goals and objectives as set forth on the preceding pages.

Chapter 4

Solution Strategy

Discussion of Solutions

A review of the current literature provided some insight into possible solutions for the successful utilization of the out-of-doors within the curriculum.

Itzkan (1990) suggested that the classroom use of computers and telecommunication equipment could be used to enhance an outdoor activity such as collecting and monitoring rain and snow samples for acid rain measurement and tracking. Students would go outside for the sampling, compile and chart the data on a computer and through telecommunications, compare data with distant sites conducting similar experiments.

Itzkan cited information revealing that over 500 classes have already participated in such an acid rain program utilizing a central computer operated by the National Geographic Society.

Hale (1986) concluded that the best vehicle to capitalize on the utilization of outdoor resources was

a multidimensional program of environmental studies. Hale related that a program of ecology or environmental education, which utilizes outdoor resources to actively engage students, could join together in a common relationship all aspects of science education, as well as, other disciplines and subject areas. Such a program, according to Hale, would have a "conceptual approach", be "practical", have a "human impact", be "issue based", be "multidisciplinary", as well as offering other benefits. Hale's findings indicated that not only was this the best way to get students into the out-of-doors but also, that "there are indisputable educational and social benefits resulting" from such a course offering (p.181).

Hale went into detail to outline the constraints and difficulties involved in taking students outside insisting, however, that with the right "attitude toward using the local environment" and, the acceptance that "ecology is an interdisciplinary area of study not...[a] separate area within the curriculum", there was hope for a successful implementation of this instructional strategy (p.184).

Both Brody (1990) and Abrams (1979) supported the notion of an interdisciplinary aspect to a program of environmental studies. While not specifically

advocating for outdoor education, both of these writers sided with the argument that any program of environmental studies, which is engaging students outside of the classroom, can be most successfully implemented by adopting an interdisciplinary approach .

Brody observed students at various grade levels in eleven Maine schools, who were studying the complex issues surrounding pollution. Brody concluded that because of the complex, multidisciplinary nature of such environmental topics, students could be best "taught using an integrated, holistic approach" (p.24).

Abrams viewed wilderness education as a tradition in America existing since the colonial period claiming that education's "interest in the environment is not an entirely new phenomenon" (p.302). Abrams strongly bolstered the argument in support of interdisciplinary environmental education using the rationale that wilderness and environmental literature have, likewise, a colonial origin. Abrams' work very ably depicted the relevance of "literary and scientific interplay" (p.304) as a part of the environmental curriculum, offering as an example, one group of students who worked outdoors, in the community, monitoring water, air, or noise pollution for five days with a science teacher while simultaneously, another group of students were at work

with an English instructor, reading and discussing literature related to the environment. Every five days the outdoor community group and the classroom group alternated instructional settings.

Keown (1986) viewed the future of the out-of-doors implementation dilemma resting on two key elements of educational enlightenment. First, said Keown was teacher education. "The most preferred method for improving use of outdoor resources...is in-service courses and workshops that teach the use of local resources" (p.32). Second, was education of the overseers. "Teachers must win support for outdoor science programs by convincing those responsible for governing the schools that the benefits outweigh the cost and the risk" (p.32).

Miles (1987) suggested that there exists "intrinsically educative qualities in wilderness" or outdoor educational experiences but cautioned those considering implementing such an instructional approach, that if they wanted to "significantly enhance the learning outcomes", or in other words, to have a successful program implementation, adequate "leadership" and "organization" are key prerequisites. (p.39)

Several authors offered specific examples ranging from very simple outdoor activities that can be

undertaken by almost any student group, to the tackling of very complex community problems by more advanced groups of students.

Kenzig (1991) reported on a program, "Science in the Sunshine", which had been successfully implemented at the elementary level. This program utilized upper grade students to serve as teaching assistants, complimenting elementary teachers who took their classes out-of-doors for hands-on environmental education.

A similar success story was related by Barton and Washburn (1991) who told of their school's use of a nearby park in conjunction with an "indoor discovery room". Emphasising hands-on activities, this program took students outside when the weather was good and utilized the indoor discovery room through the winter.

Wals, Beringer, and Stapp (1990) described a paradigm for outdoor environmental education which they termed "Action Research and Community Problem-Solving (ARCPS)". (p.13) This environmental education model encouraged students to "improve the local biophysical and/or social environment while engaged in an interdisciplinary learning process" (P.13).

In contrast to the complex model depicted in the example above, Kathleen Hogan (1990) developed a program around the tapping of sugar maple trees, to

actively engage students in a hands-on outdoor science adventure. The end result showed that many of the participating students became "stuck on science" (p.22).

Kataoka and Patton (1989) developed an integrated program of study utilizing ants as the subject of study. In this program the "relationships between the roles of ants in their society and those of humans in our society" were compared. (p.48)

The five successful illustrations above are not atypical of the literature reviewed. While in some instances, such as the latter example, the curricular intent was not specifically to move students from the confines of the classroom, non the less, the successful, positive result of utilizing the outdoors was evident. These examples, without exception, offer valid models for the types of ideas that might be included in a curriculum. In addition, they open the door of suggestion to countless modifications or spin-offs that might be successfully incorporated.

Furthermore,the dozens of articles reviewed stimulated this writer to show initiative and creativity in exploring subsequent ideas which were integrated into an overall solution strategy.

The strong suggestions of many of the researchers bears out the necessity of considering an

interdisciplinary program. The potential of "team teaching" by two instructors, one with a science background and, one coming from the social science discipline, was readily augmented in the particular work setting of the writer.

The need to provide teachers with an adequate "outdoor portfolio" of their own, as well as providing staff development, was evidenced in much of the literature as a prerequisite to outdoor education. The writer identified a viable additional solution in the use of volunteer local resource people, to supplement the teacher's knowledge bank and serve as outdoor facilitators (e.g., local foresters, game wardens, land use planners, fish and game biologists, water quality experts, etc.). Experts such as these are abundant in this locale and for the most part had been an untapped source of educational support.

The writer felt that limiting the class size to a number easily transportable with the team of instructor's personal vehicles could lay to rest many of the organizational, logistical, and transportation concerns which were evident in the literature. This was a very plausible implementation solution in this particular work setting. Because of the relatively small size of the student body and the fact that two

teachers were on hand for all activities, 50% or more of those in grades 11 and 12 potentially had the opportunity of participating in the program through a two year cycle, despite the suggested enrollment cap.

Because of the unique characteristics of this particular work setting and the relatively low student/teacher ratio which was intended, a flexible program of study such as that suggested became an ideal vehicle to capitalize upon the strengths and interest of each individual student. It is most often the case that small high school curriculums do not possess the capacity to offer the breadth or the depth as those of their larger counterparts. This program helped to alleviate that imbalance.

Finally, it was believed that funding for the cost of implementing such a unique course offering could be sought and found outside of the normal school budget process. Since this locality's sole economic base rests with outdoor resources and yet the educational system is void of any study of these vital resources, it appeared that there might exist local private interest in seeing such an educational endeavor implemented. The assumption was correct.

Description of Selected Solution

It was apparent to this writer, that the obstacles which presented themselves as stumbling blocks, deterring the transformation of what existed in the curriculum to what was a desirable situation, were not insurmountable. Utilization of local outdoor resources became a reality in this work setting.

The writer firmly believed that capitalizing on the strengths which were inherent in the unique local geography and work setting, in conjunction with the infusion of ideas generated through the research, would render an acceptable solution. The curricular vehicle facilitating this union was to be the development of a full year, interdisciplinary elective course in environmental studies, offered to students in grades eleven and twelve. The curriculum, specifically designed around the use of local outdoor resources as an extension of the classroom, sought to actively engage the students in learning relevant to their daily lives.

The successfully implemented program actualized the goal and associated objectives set forth previously in this paper. The solution was destined for success for three very obvious reasons in the eyes of the writer.

First, the program had the very vital and full

support of the school administration and district directors.

Second, the individuals involved in the research and planning, possessed a degree of enthusiasm for the project which was certain to produce a "halo effect" and insure a successful implementation.

Lastly, and perhaps the vital key ingredient in any curricular success, was the students themselves. Education not only became relevant to their own daily lives and existence, but also the students had the opportunity of becoming active participants as opposed to passive recipients in the learning process. The learning style generated by this unique instructional strategy was a new experience to most of the students and met with enthusiasm and success.

Report of Action Taken

Action taken by the writer to implement this practicum included the following:

* The writer, along with his teaching team counterpart, assumed the role of a subject area committee. Numerous "brainstorming" sessions were held resulting in the establishment of a set of broad perimeters outlining course content areas and instructional delivery methods. This guide facilitated

the curriculum development process.

* The writer developed a curriculum for the course offering (appendix A). The curriculum document was reviewed and approved by the writer's team teaching partner and also by the school's Principal/ Superintendent. Lastly, the curriculum document was submitted to the district's school board for preliminary review.

* The writer along with his teaching counterpart, generated a list of potential local resources which might be utilized in the implementation of the course offering. This list included human resources (e.g., foresters, biologists, game wardens, etc.) as well as physical resources (e.g., nearby bogs, wetlands, deer yards, woodlots, etc).

* Contacts were established with various sources who might be interested in assisting to underwrite, financially, the pilot year of this program. These initial contacts included but were not limited to environmental groups, timber land owners, local businesses and private citizens. The results of these initial meetings indicated that adequate funding could be secured to pilot the program.

* A written course description was prepared by this writer and distributed throughout the high school,

to make students aware of this new and unique course offering. Course enrollment proceeded via the school's normal enrollment procedure, except with the added requirement that students submit a short essay explaining why they wanted to be a part of this course offering. Based on the student essays and past performance of the individual student, the sixteen applicants were narrowed to eight. This selection process, delegated to the teaching team members, was additionally impacted by the desire on the part of the teachers to have a heterogeneous grouping of students.

At that juncture, implementation was ready to proceed. Appendix A, the curriculum document, explains in detail the process by which the program was implemented, and will at some future date be reviewed and revised. This curriculum framework includes the following categories:

* A statement of "rationale" justifying the creation and existence of the program.

* A statement of "philosophy" depicting the beliefs and principles that guided curriculum development.

* A "goals statement" outlining the desirable goals that would result through implementation.

* A "scope and sequence" guide explaining exactly

where in the overall school curriculum this course offering would be placed and why.

* A explanation of "lesson plans" outlining potential vehicles through which the fundamental principles of the curriculum would be translated into learned outcomes.

* A list of "sample objectives" and "sample activities" pairing specific outcomes with potential mechanisms for accomplishment.

* A process of "evaluation" by which student performance would be assessed.

* A procedure for "piloting" the new course offering.

* A curriculum "revision" procedure which would facilitate change, if needed, at the conclusion of the pilot year.

* A model for "implementation" of the course as a permanent fixture in the school district curriculum, subsequent to piloting.

* A "review" process suggesting a summative evaluation and curriculum redraft after the fifth year of implementation.

* A mandate for "staff development".

Chapter V

Results, Discussion, and Recommendations

The problem in this particular work setting was that local outdoor resources were not being capitalized on for the instructional potential they offered. The reason was clearly because of problems associated with implementing such an instructional strategy. The solution selected, utilized a program of environmental studies as a vehicle through which the undesirable situation was reversed.

Results

The single goal of this practicum was that the use of local outdoor resources, as an extension of the classroom, become a part of the school curriculum. Several specific objectives were established as a approach toward realization of this goal. Implementation of the project would be considered a success if all objectives were met. The practicum success was as follows:

* A full-year, interdisciplinary, elective course

in environmental studies was implemented. The course was team taught by the writer, who is a member of the social studies department, and one other teacher who is a member of the science department. Occasionally faculty members from other disciplines also participated. Additionally, over a dozen outside resource people (e.g., foresters, biologists, etc.) assisted in the instructional delivery process both out-of-doors and in the classroom.

* The curriculum design reflected environmental studies as a "common core" through which many disciplines were woven. Mathematics, computers, art, writing, philosophy, industrial arts, as well as other disciplines were included along with science and social studies as components of the curriculum.

* Eight students from grades eleven and twelve took part in the pilot year of this course offering. Due to the high degree of flexibility afforded through the curriculum design, students had the option of working for either science or social studies credit and additionally electing general or pre-college credit. Seven of the eight students chose the social studies option, with six of that group electing pre-college credit while one student elected the general level credit option. One student opted to earn science

credit at the pre-college level. All students successfully completed the course.

* Teacher lesson plan books and a log kept of the daily activities demonstrated that time spent outside of the traditional classroom exceeded the 15% figure which had been targeted. A sample of activities undertaken to utilize the out-of-doors as a learning environment includes the following:

1- Students along with their instructors, spent three days canoeing and camping along a river which flows by the high school. Accompanying the group as resource people and support staff were a forester, a geologist, a naturalist, and a elementary school teacher with expertise in canoeing.

2- Students along with their instructors viewed forest management practices being employed locally. Foresters served as resource people.

3- Students collected samples and monitored water quality in local streams and rivers.

4- In an on-going project, students monitored pH readings in all winter snowfall.

5- Students worked in the field and woods learning map and compass reading and basic forest surveying.

6- Students along with their instructors worked in the field with a soils scientist identifying local

soil types.

7- Students visited a nuclear power plant and a building heated with solar energy.

Discussion

The findings in the above summary clearly indicate that the goal and objectives of this practicum were met. The implementation resulted in the increased utilization of local outdoor resources as an extension of the learning environment and as a viable curriculum tool.

Additionally the program proved to be an exceptional learning experience for students and teachers as well. Students had the benefit of becoming active participants in their own learning process through the use of the non-traditional instructional strategy which was employed. The two teachers involved in the implementation benefited not only from being a part of the process, but also from the interaction with the fourteen outside resource people who volunteered their time to supplement the instructional delivery process.

Aside from the above mentioned goal and objective success, positive side effects were also evident. Most notably were the successful use of the team teaching

concept and the successful implementation of an interdisciplinary, multidimensional curriculum. Both of these accomplishments were a first for this particular high school. Additionally, the experience gained in this practicum showed that it is the rule not the exception that professionals jump at the opportunity to perform volunteer classroom and field work.

The environmental studies course offering proved to be a successful means of reducing or eliminating the implementation problems associated with shifting instruction to the out-of-doors. The writer strongly believes that this model is not only valid in this particular work setting but would produce similar results in an analogous situation.

Recommendations

To those who might be considering implementing a similar practicum plan in the future, the writer proposes the following recommendations:

* Keep class size to a manageable number. Field management of students is far different than classroom management. For a field experience to be meaningful educationally, a low student/teacher ratio is best. This teaching team found that eight students was a very

workable number with two teachers.

* Utilize outdoor resource people as often as possible. These individuals are experts in their field and can add an element to instructional delivery which the teacher or a textbook cannot.

* Plan well. Outdoor education, if it is to be a meaningful experience, requires a well thought out plan. Anticipate the unexpected.

The following suggestions are a result of this practicum and will, at some future date, be presented to the local school district administration for expansion of the problem solution in this work place.

* The practice of outdoor education should be continued and should be further expanded, by a gradual infusion process, throughout the K-12 curriculum.

* Staff development should be sponsored by the local school district to adequately introduce and prepare teachers at all levels to this non-traditional instructional strategy.

Dissemination

Since there is only a small body of knowledge in print regarding the subject of this practicum, dissemination is requisite. The writer plans the following strategy for disseminating the results of

this practicum:

* The writer anticipates presenting an oral overview of the project to available forums of interested parties including teacher workshops, environmental groups, subject area conventions, etc.

* The writer will prepare a synopsis of the project to be submitted to an educational journal for publication consideration.

* The writer will seek to have this practicum report published in the Educational Resources Information Center (ERIC) collection.

* The writer, along with his colleague and students, will prepare a video presentation of the activities undertaken in this project. This video will be made available to other school districts, state educational agencies, environmental groups, civic clubs, etc.

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Appendix A

Environmental Studies Curriculum Draft Submitted to School Board Directors

Environmental Studies Curriculum

Drafted by: Bill Crumley

Subject Area Committee:

Marcia VanCamp

Bill Crumley

Rationale

Definition: Rationale probably needs no explanation. Quite simply stated it is a reason, a justification for something - in this particular case a new course - deserving space within the curriculum.

Rationale

"What formal education has to do is to produce people who are inhabitants of the planet...Otherwise [young people] are going to grow up and discover that we have taught them to live in a world long gone".

Kenneth Boulding

In his book, The Saber-Tooth Tiger, author Harold Benjamin satirically questions curriculum content. He depicts a pre-historic society which has much education taking place but unfortunately the society may be doomed to extinction because the curriculum in use is not relevant to the present or future of the stone-age students.

As predicted of those in the opening quote by Kenneth Boulding, the inhabitants of Benjamin's curriculum farce discover that they have been taught to live in a world long gone.

Events of the past five decades including the

splitting of the atom and the invention of the microchip have brought greater social, political, and technological change to the earth than all decades combined since Benjamin's imaginary cave society inhabited the earth. At the same time, the recent half century has proportionally wreaked environmental devastation upon the planet, devastation unequaled in the earth's civilized history.

The rationale for inclusion of Environmental Studies in the curriculum is demonstrated by the two writers cited above. While learning about the past is important, students additionally need to be actively engaged in learning which is relevant to their present lives and their future existence as well. To choose any other path could spell doom for our earthly society.

Perhaps too often our curriculum is centered around what was good or what worked in the past. If our goal is to develop students who will be able to function in the next century then a program in the study of the environment is a <u>necessary</u> step in that process.

Philosophy

Definition: The curriculum philosophy is a written statement of beliefs or principles which serves both as a explanation and a parameter for the curriculum content.
Material contained within the curriculum should be both consistent with and congruent with the statement of philosophy.

Philosophy

"Man has been on a spaceship all this time. It is a tiny little spaceship, only 8000 miles in diameter...And yet this tiny spaceship is so superbly designed that it provides everything man needs for his journey through space."

R. Buckminster Fuller

The purpose of the Environmental Studies Curriculum is to develop responsible, effective, science literate citizens who are both caretakers and active participants in a rapidly expanding and rapidly changing technological global community.

The students will gain a sound knowledge of the workings of the earth's eco-system and subsequently examine the public policy questions raised by the use

or alleged misuses of that system.

Students will develop the ability to think logically and critically which in turn will enable the individual to make reasonable and rational choices, as well as, being receptive to new ideas throughout their lives. They will become the informed citizens that will be needed to pilot "spaceship earth" through the twenty-first century.

Goals Statement

Definition: A goal statement is a broad description of the desirable outcome resulting from implementation of the curriculum.

Goals Statement

The goal of the Environmental Studies Program is simply the development of environmentally literate citizens, who will become active participants in the decision making and problem solving processes of the twenty-first century.

Through this course students will:

* develop an awareness and appreciation of the environment.
* develop an understanding and awareness of their state's natural resources including forest, wildlife, and marine resources.
* develop an understanding of the impact of environmental issues in shaping public policy both locally and globally.
* develop the research, problem solving, and communications skills required to participate in the process of identification and resolution of environmental issues and problems.

Scope and Sequence

Definition: The term scope refers to the range of content that is covered in the curriculum, whereas, the sequence is the arrangement or order in which that material falls in the curriculum.

Scope and Sequence

In this particular program the range of material to be utilized is almost limitless and unpredictable. By intentional design, much of the work taken on in this course will be individualized and research based. Because of this fact, there is no foreseeing where, in the realm of environmental science and social science, we may be led.

One certainty of scope is that students will be required to utilize the full range of thinking skills. For example, a topic as basic as trees in the forest will necessitate the use of simple memorization for proper specie identification and finally beg students to formulate a value judgement on how best to manage the forest resource. The entire taxonomy of thinking skills will be put to test in each student as they seek answers to the environmental dilemma.

The school district curriculum already in place calls for elective offerings to be presented at the

grade levels of 11 and 12. In compliance with that document, that is where the placement of this course will occur.

While environmental studies are appropriate and important at all grade levels, it is important that individual courses be structured so as to match the proper intellectual development stage of the participating students. Developmentally, the participants in this program are prepared for the stage that Piaget has labeled, "formal operations". These students can think abstractly, deal with the hypothetical, they possess the logic that will foster deductive reasoning, and can conduct controlled experiments, to name a few of their developmental characteristics.

Simply stated, the material and processes being delivered are so presented at the proper juncture.

Lesson Plans

Definition: The lesson plans are the instructional design portion of the curriculum. They are the vehicle through which we translate all of the fundamental principles of the document into learned outcomes. The specificity of lesson plans is a variable factor from curriculum to curriculum.

Lesson Plans

In the case of this course offering, a very open-ended lesson format is preferable. This is desirable because of the very nature of the material under study. Much of the learning will be research based and experiential and, therefore, very unpredictable, as to how, and at what pace it will proceed. In addition, this course will attempt to individualize instruction to the needs, interest, and abilities of each student.

What will be provided as a part of this curriculum document are samples to serve as a model to the instructor. Sample activities will be furnished along with sample objectives and suggestions for a mechanism of student evaluation. No attempt will be made to tell the individual teacher what they should be doing at any given point of study or how they should be doing it as

there are many possible paths for arriving at the desired end.

Before suggesting possible objectives and activities for lesson use, it is probably appropriate to reiterate some of the earlier established principles and, at the same time, suggest a content framework within which instruction will take place.

The following brief course description will suffice for both purposes.

Environmental Studies

This course is being offered to help students develop an awareness and appreciation of the environment; to help students develop an understanding and appreciation of Maine's forest, wildlife and marine resources; to help students develop an understanding of the impact of environmental issues in shaping public policy both locally and globally. Along with classroom and lab work, students will use the local forest and water resources as an outdoor laboratory. Emphasis will be on local environmental concerns.

"The first law of environmental education:
An experience is worth 1000 pictures."

Noel McInnis

Because we believe in the value of experience, the classroom for this course will be the out-of-doors. As much as possible, this class will utilize local resources, as a living laboratory, for the study of the environment. Although learning objectives will be clearly stated, the methods and activities for arriving at those objectives will vary. In short, every attempt will be made to individualize instruction to best serve the needs, interest, and abilities of each student.

While this program is very open-ended and flexible by design, three general themes will serve as a curriculum parameter.

I. Managing our State and Local Resources
   - A. Forest
   - B. Lakes
   - C. Rivers
   - D. Wetlands
   - E. Fisheries & Wildlife
   - F. The Gulf of Maine

II. Planning and Development
   - A. Agencies
     1. Local Planning Board
     2. Regional Planning Commission
     3. State Planning Office
     4. Department of Environmental Protection (D.E.P.)
     5. Land Use Regulation Commission (L.U.R.C.)
   - B. Mock Development Project
   - C. School Site Project

III. Public Policy Issues (International, National, State, Local)
   - A. Global Warming
   - B. Acid Rain
   - C. Rain Forest
   - D. Oil Spills
   - E. Waste Disposal
   - F. Etc.

Sample Objectives

Despite the flexible design of this program which allows for individualism, there are specific objectives and outcomes which will be expected of each and every student. This list is presented to offer a few samples of specific objectives.

Sample Activities

This list is intended to demonstrate a few examples of learning activities for the Environmental Studies Program. The course of study is fashioned to be inter-disciplinary. Every attempt will be made to infuse science, math, computer science, social studies, and the humanities into activities when practical.

The following list will pair sample objectives (O), with their corresponding sample activity (A).

O- All students will learn to read and use a compass and a topographical map.
A- With a plus or minus 5% degree of accuracy, student pairs, using compass and tape, will lay out a one acre square tract of land.

O- Students will be able to identify a "wetland" and explain the vital role of wetlands in the eco-system.
A- Students, along with a resource expert, will examine a "wetland".

O- Students will be able to identify the eight predominant local species of trees.
A- Students, working in pairs, will survey and mark boundaries of a one acre tract of forest land. They will then inventory these tracts identifying all plants, trees, etc. Local foresters will serve as resource people to work with students.

O- Each student will be able to go "on-line" with a computer and communicate with a high school at some distant point of the globe.
A- Students, utilizing a telecommunications equipped computer, will participate in a global, high school, environmental monitoring program.

O- Each student will be able to discuss the pros and cons of forest management practices in use locally.
A- Students, working with local foresters, will examine the diversity of forest management techniques, currently in practice, locally.

O- Students will be able to, in an impromptu and extemporaneous manner, identify and discuss six major environmental problems facing the world today.
A- Each student will be responsible for researching a specific environmental problem (e.g., rain forest depletion, global warming, etc.). They will then report their findings in a properly structured research paper, along with an oral report which will serve to enlighten their classmates of the particular condition.

O- Students will define the term pH and discuss its significance in the study of the environment.
A- Students will collect rain and snow samples and monitor "acid rain".

O- Each student will be able to list the seven steps involved in solving a problem.
A- Students, working in teams, will participate in a "Mock Development Project" which will require them to devise a plan for the best usage of a certain tract of land.

O- Students will enhance their capacity to write.
A- Each student will maintain a journal consisting of daily class experiences.

O- Students will be able to discuss the importance of the Gulf of Maine, both as a state and a global resource.
A- Students will spend a five day residency at the Huntsman Marine Center studying marine biology and exploring the significance of the Gulf of Maine.

O- Each student will demonstrate his/her ability to perform an "on line" computer library search.
A- Students will select an author who has written about the environment (e.g., Thoreau, Muir, Carson, etc.). They will be required to search the author's work via computer, printing out the search, and then ordering a selection of the author through inter-library loan.

O- Students will be able to list local, regional, and state agencies involved in land use regulation and environmental protection.
A- Each student will attend at least one local Planning Board meeting.

O- Students will become aware of local natural resources.
A- Students, along with resource people, will canoe the Moose River "bow trip" examining the associated natural resources. This expedition will last three days.

O- Students will be able to perform basic lab analysis associated with water quality
A- Students, in conjunction with D.E.P. resource people, will, on an on-going basis, monitor water quality on the Moose River and Big Wood Lake.

O- Students will become familiar with issues surrounding management of local wildlife.
A- Students, along with resource people , will examine the winter habitat of local wildlife.

O- Students will be able to, in a scholarly manner, articulate the meaning of a "moral dilemma".
A- Each student will interview someone who, at some level, is involved in either protecting or exploiting the environment. The student will then report his/her finding to the class.

O- Students will acquire skills with both video camera and still camera.
A- Students, working as a collective team, will videotape their class activities and produce an edited finished product. A local professional will serve as a resource person.

O- Students will enhance the vital communications skills.

A- The class, as a whole, will correspond with a high school class in Hungary, discussing topics relevant to high school students. This will be accomplished via video letters and written letters.

Evaluation

Definition: Evaluation, in this particular case, is the process we use to assess student performance. Evaluation has many applications, but it's primary function is to see if the methods and activities are producing the stated objectives. In plain language, it serves to prove that the individual student has learned what it is that you set out for him/her to learn.

Evaluation

While some of the objectives of this course of study lend themselves to objective types of measurement, they will be the exception and not the rule. Generally student evaluation will be more subjective in nature.

It is true that there have been shown some specific desired outcomes for each and every student, however, the true key element of this curriculum design is individualism - building on the needs, abilities, and preferences of each individual student. Mastery will not be referenced collectively, but will be established individually much of the time.

In understanding the rationale behind this method of student assessment, it probably bears importance to look back at the single goal of this program.

"The goal of the Environmental Studies Program is simply the development of environmentally literate citizens who will become active participants in the decision making and problem solving processes of the twenty-first century." (p.47)

In the same vein, it is worth noting that each objective listed for acquiring that goal begins with the words "help students".

In short, it is not the intent of this program to produce a collective body of students who have mastered a collective body of knowledge. Rather, we propose individual students who have progressed and mastered in the realm of what Vygotsky has labeled, their individual "zone of proximal development". They have each mastered to their individual potential.

It is through such a subjective and individualized system of evaluation that we will accomplish our goal of producing citizens for the new millennia, who possess the self-esteem, confidence, and knowledge to be active participants in the socio/political decision making process.

Piloting

Definition: Piloting is the process of trying out or testing a proposed addition or change to the curriculum before permanently implementing that addition or change.

Piloting

Although unwritten in their policy manual, it has been past practice of the local board, to request that new programs be piloted before given permanent residence in the curriculum.

In the case of this program the pilot will take place during school year 1991-92. Oversight for the project will rest with those who have been responsible for developing the program and constructing the curriculum. They shall, hereafter, be identified as the Subject Area Committee. The flow of information shall proceed from the Subject Area Committee, to the Principal, to the School Board of Directors with feedback flowing in a reverse process.

The Subject Area Committee will develop and pilot the course in accordance with the stated goals and objectives. This committee will staff the pilot program and maintain an ongoing, formative evaluation while the program is operating. Changes to the program will be

implemented by this committee as they see fit. At the conclusion of the pilot, a final written recommendation for 11-12 Environmental Studies Elective will be produced by this committee.

In this particular pilot, the teachers who will team-teach this interdisciplinary offering and the Subject Area Committee are one and the same, therefore, communication at this level is not an area of concern. Because this course is multidimensional, however, and attempts to span all disciplines, the pilot staff will attempt to keep all interested members of the faculty informed of course developments.

Lastly, the pilot staff will be responsible for compiling an "as delivered" description including course outline, descriptions of units, actual examples of instructional strategies and student activities, evaluation tools and methods, list of resources, etc.

Revision

Definition: Revision, as might be expected, is simply the process of taking what has been done and making changes to better the curriculum prior to implementation.

Revision

Upon completion of the pilot year, the Subject Area Committee will review all relevant material and produce a formative evaluation. At this juncture, they will have two options. One, draft a final curriculum guide for 11-12 Environmental Studies Elective and submit it to the board for implementation or, they may choose to recommend to the board that the program not be implemented.

Implementation

Definition: Implementation is the act of making the course a permanent part of the overall curriculum. In addition it is the process of delivering the course.

Implementation

Upon a positive action of the school board, actual implementation will be accomplished by use of the same committee structure that oversaw the pilot program. They are the most knowledgeable and the logical choice to fulfill this function.

The school board, through the principal, will provide oversight for the implementation process, as well as, providing public relations. In addition, they will insure continuing support services for staff development.

The Subject Area Committee will monitor the implementation to insure that the "taught curriculum" for 11-12 Environmental Studies is consistent with the "written curriculum". In addition, they will maintain an continuing evaluation process of the program, arrange for staff development, and maintain an ongoing dialogue with the faculty.

Teachers will be responsible for translating the philosophy, goals and objectives into classroom activity.

Review

Definition: Review is the process of formative and summative evaluation.

Review

As previously stated there will be an ongoing formative evaluation process initiating, as soon as the program has been implemented. Because this program has been structured to be a very flexible process, the Subject Area Committee is empowered to make changes that they view as being in the best interest of accomplishing the goals of the program and meeting the needs of the students. The final charge delegated to the Subject Area Committee, will be the completion of a summative evaluation during the fifth year of implementation.

Because education, and everything associated with education is currently in a state of flux, it is recommended that the maximum life of this curriculum is to be five years. During the fifth year of implementation, a new committee will be appointed and assigned the responsibility of completely redrafting the course curriculum.

Staff Development

Definition: Staff development is the process of upgrading the knowledge and skills of those responsible for translating curriculum goals and objectives into outcomes. It is a key and final ingredient, lest the curriculum and the teacher become static.

Staff Development

As has been indicated throughout this document, staff development is an ongoing process, supported by all factions involved with the curriculum process.

The need is evident and requires little justification or explanation. Education is changing rapidly. Environmental Studies is a relatively new discipline, new ideas and research are surfacing almost daily. Finally the subject matter itself changes at an equally fast pace. New issues, new problems are constantly surfacing.

Teachers who choose to enter this subject area must do so with the understanding that they themselves are becoming students. This school district board of directors as well as future boards must by the same token accept the obligation of providing staff development on an ongoing basis.

References (Appendix A)

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